

NON-PUBLIC?: N
ACCESSION #: 8801270100

LICENSEE EVENT REPORT (LER)

FACILITY NAME: Indian Point, Unit 3 PAGE: 1 of 3

DOCKET NUMBER: 05000286

TITLE: Unit Trip Caused by Malfunctioning Relay
EVENT DATE: 12/22/87 LER #: 87-012-00 REPORT DATE: 01/21/88

OPERATING MODE: N POWER LEVEL: 100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: Maryanne F. Quinn - Associate Reactor Engineer
TELEPHONE #: 914-736-8344

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: JC COMPONENT: 94 MANUFACTURER: W120
REPORTABLE TO NPRDS: Y
CAUSE: X SYSTEM: FK COMPONENT: LS MANUFACTURER: I004
REPORTABLE TO NPRDS: N
CAUSE: B SYSTEM: ID COMPONENT: CMP MANUFACTURER: C490
REPORTABLE TO NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT: On December 22, 1987, with the reactor at 100 percent power, an automatic unit trip occurred while plant personnel were performing a monthly surveillance test on the Reactor Coolant Low Flow Protection System. All plant systems functioned properly following the trip with two exceptions: 1) motor operated disconnect F1-3 did not automatically open following the opening of generator output breakers and would not open via its Control Room flight panel switch, and 2) the plant computer provided an incomplete Sequence of Events Report. It was determined that, the tripping of a bistable switch associated with a Low Reactor Coolant Flow Logic relay during the test (Loop 4, Channel I) in conjunction with a high resistance contact on a similar relay in the same loop (Loop 4, Channel III) resulted in the de-energization of a Low Reactor Coolant Flow matrix output relay and caused the reactor trip. Reactor Coolant flow was actually normal at the time of the trip. The relay for Loop 4, Channel III was found to be faulty due to tarnish build-up

on a relay contact. After replacing the faulty relay, the reactor was brought critical on December 23, 1987. The unit was synchronized to the bus on December 24, 1987.

(End of Abstract)

TEXT: PAGE: 2 of 3

At 1630 hours on December 22, 1987, during the performance of Surveillance Test 3PT-M3, "Reactor Coolant Flow Analog Functional", a "Loss of Flow Single Loop" reactor trip occurred. The unit was operating at 100 percent power with normal reactor coolant flow at the time of the trip. All plant systems functioned properly following the trip with two exceptions: 1) motor operated disconnect switch F1-3 (Codes X, FK, LS, ITE Type MO-10) did not open automatically following the opening of the main generator output breakers and would not open via its Control Room flight panel switch, and 2) the plant computer (Codes B, ID, CMP, no model or serial number) provided an incomplete Sequence of Events (SOE) report.

Above 50 percent reactor power, if two of the three instrument channels indicate a low flow condition in any one of the four reactor coolant loops an automatic reactor trip will be initiated. Surveillance Test 3PT-M3 is performed such that one channel on each of the four loops is tested prior to proceeding to the next channel. After completing testing on Loops 1, 2, and 3 of Channel I, the bistable switch for Loop 4, Channel I (FC-444X) was actuated. A reactor trip followed immediately.

Investigation revealed that a contact on the Reactor Coolant Low Flow logic relay for Loop 4, Channel III, (relay FC-446X) (Codes X, JC, 94, W120, Westinghouse No. BF66) exhibited high resistance. This condition, coupled with the actuation of the bistable switch in Loop 4, Channel I (relay FC-444X) during the test, provided the two out of three logic matrix to cause the "Loss of Flow Single Loop" reactor trip.

Upon removal and examination of relay FC-446X, a buildup of tarnish was observed on the surface of one of the contacts. This tarnish buildup created a voltage drop across the contacts resulting in an output voltage insufficient to "hold in" matrix output relay LF-4X. Relay FC-446X was replaced with a new, identical Westinghouse type BF66 relay. The new relay was tested and operated satisfactorily. The remainder of Surveillance Test 3PT-M3 was performed with acceptable results. In order to preclude recurrence, a statistical sampling of protection logic relays was developed. The sample test program measured contact resistance while cycling the logic relays. All reactor coolant flow relays in all four channels were tested, with satisfactory results.

TEXT: PAGE: 3 of 3

Following the reactor trip, motor operated disconnect switch F1-3 did not open automatically and would not open via its Control Room flight panel switch. The disconnect switch was opened locally at the Buchanan Switchyard. The opening of this switch allows for reclosure of the generator breakers after a trip to provide continuity in the switchyard electrical ring bus. The failure of this switch to open after the trip did not affect the ability of the plant to shutdown normally. Subsequent testing included simulating the opening of main generator breakers, and cycling the disconnect switch via the Control Room. In both cases results indicated proper functioning of motor operated disconnect switch F1-3. No cause has been found for the disconnect's misoperation.

Following the reactor trip, the "A" Critical Function Monitoring System (CFMS) plant computer provided an incomplete Sequence of Events (SOE) Report. Due to an automatic, three-minute, hourly communication self test which was running at the time of the trip, the first event on the SOE report did not start at time zero, as required. Since the computer utilizes the same clock for tracking the SOE as for the self test program, the starting time recorded for the SOE was the time progressed into the self test. Due to programming and processing errors the SOE which was generated contained some erroneous information. The "B" CFMS computer was out of service for maintenance, which prevented it from generating the backup SOE report. A test program of random sampling of SOE input points was conducted to verify point recognition by the SOE. A program of continued periodic SOE sampling is under review. Prior to start-up, the "A" & "B" CFMS computers were restarted and a functional check was performed to test both units. Plant computer software is under examination to resolve problems with the clock and SOE Report generation.

This event is reportable under 10CFR50.73(a)(2)(iv). No similar events have been reported in an LER to date. An evaluation has determined that no other safety concerns exist as a result of this event. The reactor was brought critical on December 23, 1987 at 2048 hours. The generator was synchronized to the bus on December 24, 1987 at 0240 hours and a load escalation was initiated. Full reactor power was reached on December 25th at 1645 hours.

ATTACHMENT # 1 TO ANO # 8801270100 PAGE: 1 of 2

Indian Point 3
Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511
914 739 8200

New York Power

Authority

January 21, 1988

IP3-88-003

IP3-88-007H

Docket No. 50-286

License No. DPR-64

Document Control Desk

U. S. Nuclear Regulatory Commission

Washington, D. C. 20555

Dear Sir:

The attached Licensee Event Report LER 87-012-00 is hereby submitted in accordance with the requirements of 10CFR50.73. This event is of the type defined in Paragraph 50.73(a)(2)(iv).

Very truly yours,

/s/ For

William A. Josiger

Resident Manager

Indian Point 3 Nuclear Power Plant

JJA:sn:LER3:12

Attachment

cc: Mr. William Russell

Regional Administrator

Region 1

U.S. Nuclear Regulatory Commission

631 Park Avenue

King of Prussia, Pennsylvania 19406

INPO Records Center

Suite 1500

1100 Circle 75 Parkway

Atlanta, Georgia 30339

ATTACHMENT # 1 TO ANO # 8801270100 PAGE: 2 of 2

LER-87-012-00

bcc: IP3 Resident Inspectors' Office

J. P. Bayne, WPO

J. C. Brons, WPO
G. M. Wilverding (SRC), WPO
Records Center, (WPO)
S. Novak

*** END OF DOCUMENT ***
